

CLAIMS

1. A method of transmitting data packets in an uplink from a plurality of source user equipments to a base station, the data packets being for onward transmission to a plurality of destination user equipments, the method comprising the steps of:

determining a measure of a quality of service from the base station to a destination user equipment; and

scheduling uplink transmissions from the source user equipments to the base station in dependence on the measure of a quality of service.

2. A method according to claim 1, wherein the measure of a quality of service is determined at the base station.

3. A method according to claim 2, wherein the base station transmits an indication of the quality of service to a user equipment.

4. A method according to claim 2, wherein the base station transmits to a user equipment an indication of a transmission format to be used by the user equipment.

5. A method according to any of the preceding claims, wherein the base station determines a measure of a quality of service for each of the plurality of destination user equipments.

6. A method according to claim 5, wherein the base station determines a credit value for each destination user equipment, the credit value being based on the measures of the quality of service, and the base station transmits each credit value to the corresponding source user equipment.

7. A method according to claim 6, wherein the credit value for each destination user equipment is obtained by comparing the measure of the quality of service for that destination user equipment with measures of the quality of service for other destination user equipments.

8. A method according to any of the preceding claims, wherein a plurality of different measures of a quality of service are determined for each of the plurality of destination user equipments.

9. A method according to any of the preceding claims, wherein at least one of the following measures of the quality of packet delivery from the base station to a destination user equipment is determined:

- (a) throughput ratio
- (b) ratio of satisfied packets
- (c) base station buffer occupancy.

10. A method according to claim 8 or 9, wherein, for each destination user equipment, the base station compares each of the measures of the quality of service for that destination user equipment with the corresponding measures of the quality of service for other destination user equipments, to give a plurality of relative measures.

11. A method according to claim 10, wherein the base station obtains at least one of the following relative measures:

- (a) distance from average throughput ratio
- (b) distance from minimum throughput ratio
- (c) distance from minimum quality of service
- (d) distance from minimum buffer length.

12. A method according to claim 10 or 11, wherein the base station combines the plurality of relative measures for each destination user equipment to give a single credit
5 value for that destination user equipment.

13. A method according to any of the preceding claims, wherein a source user equipment receives a credit value based on the measure of the quality of service, and
10 determines a time and/or rate of packet transmission based on the credit value.

14. A method according to claim 13, wherein the source user equipment determines the time and/or rate of packet
15 transmission based additionally on a measurement of radio channel conditions.

15. A method according to claim 13 or 14, wherein the source user equipment determines the time and/or rate of
20 packet transmission based additionally on the type of service.

16. A method according to any of the preceding claims, wherein uplink transmissions are scheduled using rate
25 scheduling.

17. A method according to any of the preceding claims, wherein uplink transmissions are scheduled using hybrid
rate-time scheduling.

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18. A method according to claim 16 or 17 further comprising a step of switching from one to the other of rate scheduling and hybrid rate-time scheduling.

19. A method according to any of the preceding claims, wherein the rate of uplink transmission is varied by adjusting the modulation and coding scheme level.

5 20. A method according to any of the preceding claims, wherein the rate of uplink transmission is varied by adjusting the intervals at which the uplink transmissions take place.

10 21. A method according to any of the preceding claims, wherein a source user equipment receiving an indication of a good quality of service transmits data packets to the base station at a lower rate than would otherwise be the case.

15 22. A method according to any of the preceding claims, wherein a source user equipment receiving an indication of a poor quality of service transmits data packets to the base station at a higher rate than would otherwise be the case.

20 23. A method according to any of the preceding claims, wherein a source user equipment receives credit values based on measures of the quality of service, and stores a history of the credit values.

25 24. A method according to claim 23, wherein a user equipment with a worsening history of credit values transmits data packets to the base station at a higher rate than would otherwise be the case.

30 25. A method according to claim 23 or 24, wherein a user equipment with an improving history of credit values transmits data packets to the base station at a lower rate than would otherwise be the case.

26. A method according to any of the preceding claims, wherein the base station operates a scheduling mechanism for downlink transmissions.

5 27. A method according to any of the preceding claims, wherein the base station transmits the data packets directly to the plurality of destination user equipments.

10 28. A method according to any of claims 1 to 26 wherein the base station transmits the data packets to the plurality of destination user equipments via a network.

15 29. A method according to any of the preceding claims, wherein a new credit value is periodically determined and sent to the source user equipment.

20 30. A base station for receiving data packets in an uplink from a plurality of source user equipments for onward transmission to a plurality of destination user equipments, the base station comprising:

 means for determining a measure of a quality of service from the base station to a destination user equipment;

 means for producing a credit value based on the measure of the quality of service; and

25 means for transmitting the credit value to a source user equipment.

30 31. A base station for receiving data packets in an uplink from a plurality of source user equipments for onward transmission to a plurality of destination user equipments, the base station comprising:

 means for determining a measure of a quality of service from the base station to a destination user equipment;

means for determining, based on the measure of a quality of service, a transmission format to be used by a user equipment in scheduling uplink transmissions from the user equipment to the base station; and

5 means for transmitting to the user equipment an indication of the transmission format to be used by the user equipment.

32. A user equipment for transmitting data packets in
10 an uplink to a base station for onward transmission to a plurality of destination user equipments, the user equipment comprising:

means for receiving from the base station a credit value, the credit value being an indication of the quality
15 of service from the base station to a destination user equipment; and

means for scheduling uplink transmissions from the user equipment to the base station in dependence on the credit value.

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33. A communications system comprising a base station according to claim 30 or 31 and a plurality of user equipments according to claim 32.